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# Basement depth and sedimentary infill from deep seismic reflection data at the western tip of the offshore Corinth Rift

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The Corinth rift is a young continental rift located in central Greece. The active part of the rift forms an E-W striking depression – the Gulf of Corinth – that is the deepest in its central part. Extensive seismic surveys have imaged the basin's basement and allowed to estimate the total extension across most of the Gulf except its western tip. Extension is high in the central part and decreases westward and eastward, as reflected in the present-day bathymetry. Two decades of GPS measurements have shown that the extension rate increases westwards from ∼5 to 10-15 mm yr-1, but this is not consistent with the long term pattern. However, no data allowed so far to estimate the basement depth at the western tip of the Gulf, where the geodetic extension rate is the largest. Such data would allow to check the apparent inconsistency between the present rate and the long-term estimates of crustal extension. We present here an unpublished multichannel seismic line dating from 1979 and crossing the western tip of the Gulf of Corinth. The line is 22 km long and strikes WNW-ESE, from the Mornos delta to the West-Channel fault. A Maxipulse source has been used, allowing to image the basement below the synrift sedimentary infill. To the east, a ∼1.6 km deep basin is imaged between the southern margin of the Gulf and an inactive south-dipping fault located between the Aigion and the Trizonia faults. The sedimentary infill consists in an alternation between basin-focused bodies made of incoherent reflections and more extensive high-amplitude reflectors. Attributing this alternation to eustatic variations give an age of 300-350 ka to the oldest well imaged deposits. Northwest of the Trizonia fault, the basement is imaged at shallower depth, i.e. ∼450 m. The western tip of the seismic line reaches the Mornos delta, close to the northern shoreline. There, the depth to the basement is larger, reaching ∼1.2 km. The infill is made of 3 units : on the basement lies a thin unit of incoherent reflections that may corresponds to coarse-grained fluvial deposits. A second unit of parallel, high-amplitude, low-frequency reflections could represent deeper-water deposits. The last seismic unit represents the Mornos delta coarse-grained deposits, from 0 to ∼0.7 km deep. The depth of the basement deduced from this seismic line at the western tip of the Gulf of Corinth (1.2-1.6 km) is shallower than the one in the central part of the Gulf (2.5-3 km). This reinforce the inconsistency between long-term and short-term rates of extension in the Corinth Rift, which may be explained by assuming that the Western Corinth Rift initiated much later than the Central Rift. These data also allow to constrain the total displacement on the N-dipping Psathopyrgos fault, one of the major, normal, basin-bounding faults at the western tip of the Rift. The total offset would reach 2.1-2.3 km and the uplift/subsidence ratio would be ∼1:1.7, implying a slip rate of 2.2-2.5 mm yr-1 based on footwall uplift rate data.